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case of the current sensor in accordance with figure 1. Given a deviation  $\delta$  in the phase delay  $\phi$  of the  $\lambda/4$  segment of  $90^\circ$ , the reflection interferometer behaves like a Sagnac interferometer with two identical  $\lambda/4$  segments whose axes are aligned parallelly. The current-induced differential phase shift is then approximately

$$\Delta\Phi'_R \approx \Delta\Phi_R [1 + \delta^2/2] \quad (9).$$

$\Delta\Phi_R$  is given by equation (2). If the temperature dependence of the phase delay of the  $\lambda/4$  segment is  $-0.0153^\circ/^\circ\text{C}$ , as in the above example, the phase delay angle is to be set to  $105^\circ$  at room temperature, and the length  $L$  of the segment is to be selected correspondingly in order to achieve compensation of the temperature dependence of the Verdet's constant  $V$ .

#### IN THE CLAIMS:

*Kindly replace Claims 1-9 with the following:*

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1. (Twice Amended) A fiber optic current sensor, comprising:  
a coiled sensor fiber which encloses a current conductor (S), and at least one phase delay element adjoining the sensor fiber, wherein the at least one phase delay element has a phase delay with a temperature dependence which at least approximately compensates for a temperature dependence of a Verdet's constant (V) of the sensor fiber.

2. (Twice Amended) The current sensor as claimed in claim 1, wherein the at least one phase delay element has a phase delay angle whose value deviates from a phase delay angle of an ideal phase delay element.